Because individuals do not take the true externality into account in making their personal choices, it is not clear in this case whether the total welfare of the members of society would be maximized by allowing individuals to make free choices with increased welfare payments. This would argue for a commodity specific program like a telephone voucher to ensure that the external benefits are captured. Given the small costs associated with running a commodity-specific program through the rate structure and the externality gains of increasing penetration, we might conclude that a lump sum transfer from the treasury to the phone system to make up the revenue shortfall from lowered rates for eligible households would be optimum. Rates for the target group would be lowered, but rates for others would not be raised.

But the network externality introduces another complexity. Only ratepayers benefit from the network externality. The benefit is neither universal nor is it interchangeable—only people on the network enjoy it and it can only be enjoyed in the form of increased communications.

Funding a program to increase penetration rates through the tax structure constitutes a transfer of welfare from some taxpayers who derive no such benefits to ratepayers who do derive this benefit. Their loss of welfare may not be offset—in an efficiency sense—by the gains in welfare of ratepayers. Because of the network externality, aggregate efficiency and equity are served best by a transfer from ratepayers delivered to eligible households through the rate structure.

If a public utility commission decides to participate in the Lifeline program, it should consider an inclusive approach to defining eligibility.

2. Eligibility and Certification

Since the goal of these programs is to maximize the size of the network and relieve the burden that having a phone places on household budgets, eligibility criteria should be inclusive, rather than exclusive.

In the Lifeline program, for example, the program should not be targeted just to households who are currently enrolled in or eligible for any of the four major public assistance programs—Aid to Families with Dependent Children, Supplemental Social Insurance, Medicaid, and Food Stamps—but also to households with incomes below 125 percent of poverty.

Because so many low-income people are not enrolled in any public assistance program, we believe current Lifeline programs will fall far short of Congress's goal of promoting universal service at just, reasonable, and affordable rates for these populations, if the policy relies only on enrollment in specific programs to establish eligibility for universal service support. Therefore, it should also establish a self-certified income limit of 125 percent of poverty as an enrollment criteria.

Setting the cut-off at 125 percent of poverty accomplishes a number of purposes. Households eligible for these programs are obviously low-income households; the empirical evidence indicates that low-income households are the households who are most likely to drop off the network as a result of rising prices. At 125 percent of poverty, income is roughly $15,000 as an upper limit. In Table III-1, we saw that over two-thirds of the households in the nation lacking telephone service have incomes below this level. This effectively targets the population at risk for losing telephone service. It also targets the population for which service at current rates imposes a serious burden on household resources.

A similarly inclusive approach should be taken for consumers with disabilities. For example, Wisconsin allows self-certification for support. It allows the subscriber to identify those services—CPE or network services—which best suit the needs of the consumer. An auditing and dispute resolution process should also be provided for.

Self-certification of eligibility, with periodic auditing of recipients, is cost-effective for administering the program. Self-certification coupled with partial auditing would be the most cost-effective mechanism.

B. Delivering services in high-cost areas

One of the areas in which the states will be most active is in setting up programs to ensure service in all areas of the state. Although the FCC has made funds available for certain high-cost areas, the vast majority of support to these areas has come from intrastate funds. Moreover, the obligation on telecommunications carriers to serve these areas has been carried out at the state level.

1. Providing service as a carrier of last resort

There must be a carrier of last resort designated for each area of the state. Public policy will simply not allow basic telephone service to be unavailable in an area.

The provider of last resort will be responsible for the maintenance of the facilities necessary to provide basic telephone service. The availability of facilities is the key to the availability of service. Responsibility for facilities is the key distinction between carrier of last resort obligations and the "all comers" obligation. A new entrant might be making service available to all customers within a given area through resale and therefore could not serve as the carrier of last resort.

The carrier of last resort can only draw from the universal service fund to support its obligation to maintain facilities in high-cost areas. For the vast majority of lines in a state, being the carrier of last resort creates no unique economic burden because rates cover costs. Only in areas designated by the Commission as high-cost will the carrier of last resort be allowed to receive support to cover the difference between the cost of service and the rates charged.

To the extent that an area is a "high-cost" area, there should be only one service provider allowed to draw funds from a subsidy pool to support service. A new entrant drawing from the fund must be facilities-based for the customer for whom they seek to be the carrier of last resort and must be willing to shoulder the obligation to maintain those facilities, meaning it should seek designation as a carrier of last resort where it has facilities.

It makes no sense from a public policy or efficiency point of view to subsidize the existence of more than one supplier in a high-cost area.

2. Identifying any necessary subsidies

In order to estimate the amount that can be drawn from the fund, the carrier of last resort will have to make additional showings of eligibility before it is allowed to draw from the universal service fund (USF) and to determine how much it can draw for the purposes of discharging its obligation as the carrier of last resort.

The amount to be recovered from the USF to meet carrier of last resort obligations should not exceed the difference between the benchmark costs and rates in effect in the area, or any documented revenue shortfall in the aggregate, whichever is less. If the company is earning its authorized rate of return in the aggregate, it is not suffering any loss due to its service obligation. If the company is earning its allowed rate of return through the rates it charges the public and then the Commission allows it to draw additional funds from the USF, for its carrier of last resort obligations, the company will immediately be in a situation of excess earnings.

The carrier of last resort must demonstrate the prudence of investments which it claims have been made to meet its carrier of last resort obligations. The costs for which it claims to need subsidies for must be prudently used and useful.

The carrier of last resort should not be allowed to earn a return on capital that is no longer used and useful. Any recovery of these assets should take place from the "stranded" investment fund.

All revenues associated with investments must be included in any calculation of any loop-specific shortfall. That is, revenues associated with vertical services as well as toll services should be included in any estimation of the under-performance of assets.

The company should not be allowed to claim a loss on a subscriber line, when it is making very high profits on monopoly vertical services, such as call waiting, which use that line. Nor should the loop which is used for a variety of services—local, enhanced, and long distance—be attributed solely to local services. All services which use the loop should pay for their use. The shared nature of the loop can be taken into account either through cost allocation or through revenue attribution, or both. The line between what is a "reasonable contribution to shared costs" and what is a "subsidy" is difficult to draw. The most effective approach is to include all revenues in estimating the viability of high-cost exchanges. The eligible area must be defined to include reasonably contiguous or immediately adjacent areas with lower cost or higher revenues

On a going-forward basis, the Commission must not allow incumbents to enjoy a risk-free investment that earns a risk premium. Being paid for costs from a "social obligation pool" removes those revenue streams from market risk. Rate of return earned on USF investments should be lower than a company-wide rate of return.

Commissions have set rates for decades to recover an overall revenue requirement based on the total investment of the company. A social obligation pool pulls certain assets out of that overall rate base and treats them differently on a going-forward basis. The company is given protection against risk of above-reference price costs by recovering these revenues from a social fund, not the marketplace. Furthermore, should the company lose a customer, it would seek to recover the "stranded" investment costs from the carrier of last resort fund under the same argument used to recover previously abandoned investments. This arrangement clearly eliminates major components of risk associated with the assets. Therefore, in calculating the potential draw from any carrier of last resort pool the lowered risk of the assets must be taken into account.

C. Delivering service to public institutions

1. Defining services

The law singles out important public institutional telecommunications users (elementary and secondary schools, libraries, and health care providers) to lead societal implementation of advanced telecommunications services (Section 254(h)). The Commissions are faced with the task of identifying which services to support and how to support them.

These decisions should follow a clear set of guidelines to ensure that society receives good value for this social investment in technological applications. The principles previously articulated for the expansion of universal service to individuals should be applied to public institutions. But the law requires that these principles be applied to more advanced services.

The law states very clearly that advanced services must be "technically feasible and economically reasonable" (Section 254(h)(2)(A)

Social benefits would be maximized if what are essentially the next generation of services that can reasonably be identified as being available through the network are supported. This approach will ensure the best social outcome for a number of reasons.

First, by identifying the next generation of services that are likely to become widely available, the cost of the provision of these advanced services will be reasonable. Such services have already been developed and are available on a broad basis. Second, applications for these services will likely become available at a relatively modest cost and high level of technology. Third, because these services are around the corner, they are likely to take root easily in the society at large. Both the audiences and the professionals to be served by these services are likely to have a solid basis for learning how to use and benefit from these applications.

Following this formulation, we believe that ISDN applications should be considered the advanced services to be made available to schools, libraries, and hospitals at discounted rates. The network infrastructure—digital switches with the necessary software, signaling system seven, and copper wire—are largely deployed and the costs have been, or will soon be, put into the rate base. This technology could make services such as high quality video, high speed data, meter distance learning, medical imaging, and home shopping available over this copper network, to name just a few that are already in existence. The customer premise infrastructure is also available. There are millions of communications platforms waiting to hook into the information age—PCs, workstations, and main frame terminals—in the targeted institutions.

The incremental investment necessary to open the door is small compared to the costs already deployed in the network. And virtually all of the investment necessary to achieve this rapid deployment of the copper-based information age would have to be made to achieve a workable broadband network at a later date because the network will have to be digitized end-to-end in any event.[73]

A recent *MACWorld* survey analyzed the technologies necessary to deliver a list of 30 services that are being considered as advanced telecommunications services. The survey found that all but entertainment video applications can be delivered with the current network or a digital dialtone over copper. And the entire list of examples identified in the conference report would not only be supported by ISDN, but would be delivered at speeds 5 and 10 times more rapid than are presently available to the general public.

> They are intended, for example, to provide the ability to browse library collections, review the collections of museums, or find new information on the treatment of an illness, to Americans everywhere via schools and libraries...
>
> For example, the Commission could determine that telecommunications and information services that constitute universal service for classrooms and libraries shall include dedicated data links and the ability to obtain access to educational materials, research information, statistics, information on government services, reports developed by federal, state, and local government, and information services which can be carried over the Internet.[74]

All of the services mentioned in this list are identified by the *MACWorld* survey as deliverable by ISDN or less advanced and less expensive technologies.

2. Establishing discounts for advanced services

The law requires that, upon a bona fide request from a public institutional telecommunications user, services be made available at discounted rates.

With respect to the level of this discount, we believe that the Commission should establish a permissible range for the discount and let the states and the rule of good governance dictate where the precise rate is set in individual locations

The range of acceptable discounts should be bound by the incremental cost of the service as a base. This ensures that there is no subsidy involved, since the service would be covering its incremental costs. The fact that the law does not require a subsidy, but rather a discount, cannot be ignored by the Commission.

On the high end, the limit should be a discount that is equal, on a percentage basis, to the discount offered to low-income households. This is an amount roughly equal to 50 percent.

That is, it is currently Commission policy to waive the full subscriber line charge for low-income households, if the state matches that waiver. The net effect, on a national average basis, is to reduce the cost of basic service. The Commission also picks up the cost of installation of telephone service of up to $30, which is approximately 75 percent of those charges on a national average basis.

The Commission should order that ISDN services be made available to schools, libraries, and hospitals at a charge between the incremental cost of the service and one-half of the tariffed rate for the service.

For more advanced services a number of the public institutions have advocated an approach that is consistent with the above principles. They argue that public institutions should be allowed to purchase any available service at a rate comparable to the lowest rate the telephone company charges its commercial customers for a similar service. That is, telephone companies frequently offer large discounts to their large customers. Public institutions believe they should have access to similar services at similar rates.

This imposes no burden on the local company, since it is willing to make these rates available in the marketplace. It also encourages the public institutions to be cautious in what service they ask for, since they still will have to pay a commercial rate.

Endnotes

1. Cited in Herbert S. Dordick, "Toward a Universal Definition of Universal Service," Institute for Information Studies, *Universal Telephone Service: Ready for the Twenty-First Century*, 1991, p. 115.

2. Milton Mueller, "Universal Service in Telephone History: A Reconstruction," *Telecommunications Policy*, July 1993, p. 364, (hereafter, Mueller) cites the statement of the definition of universal service in the 1909 AT&T annual report, which does not include references to the highway system and its ubiquitous interconnection of every to every.

3. U.S. Department of Commerce, Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970* (Washington, D.C., 1975), p. R1-12 (hereafter, Historical Statistics).

4. Mueller argues that "the most important historical factor contributing to extensive coverage and high penetration in the USA was 20 years of intense rivalry between telephone systems that were not connected to each other (p. 369)." Since the period of intense competition ended with almost three-quarters of the population not subscribing to telephone services, it seems more reasonable to suggest that competition was one factor which contributed to relatively high penetration in the U.S. in the early period of the industry, but certainly not the ultimate high level of penetration. It is also worth noting that a number of developed nations have achieved as high or higher penetration without competition. Mueller concedes that AT&T's commitment to long distance service resulted in "a nationally interconnected network (p. 369)."

5. Historical Statistics, p. R 1-12.

6. *Communications Act of 1934*, 47 U.S.C.A. 151 et seq.

7. *Telecommunications Act of 1996*, Public L. No. 104-104, 110 Stat 56(1996) (hereafter, 1996 Act, or the Conference Report).

8. Industry Analysis Division, Common Carrier Bureau, *Trends in Telephone Service* (Federal Communications Commission, May 1996), Table 2.

9. Conference Report, p. 1.

10. The FCC will receive the advice of a Joint Board made up of three FCC Commissioners, four state regulators, and one consumer advocate in the area of universal service.

11. Unlike Canada, where regulatory authority over telecommunications has been transferred from the provinces to the federal government, the final version of the Telecommunications Act of 1996 stripped out language that would have pre-empted the form of rate regulation in the states. Moreover, each of the major sections of the bill which implements a national policy goal for competition and universal service also explicitly preserves the authority of the states to act in its own way, as long as those actions are consistent with national policy (see Sections 251(d)(3), 252(b)(4), 253(b), 254(f)).

12. Herbert S. Dordick, "The Origins of Universal Service: History as a Determinant of Telecommunications Policy," *Telecommunications Policy*, June, 1990, p. 224, offers the following observation on the most fundamental impact of telecommunications.

> Chandler, the economic historian, wrote that the 'visible hand of management replaced the invisible hand of the market forces where and when new technology and expanded markets permitted a historically unprecedented high volume and speed of materials through the process of production and distribution. The visible hand of management was significantly enhanced by the telegraph, and later the telephone.

13. Harmeet Sawheny, "Universal Service: Prosaic Motives and Great Ideals," *Journal of Broadcasting & Electronic Media*, Fall 1994, p. 389, outlines the need for a localized strategy.

> The past experience with other services suggests that expanded universal service for telecommunications will eventually emerge out of an intensely contested process....This analysis leads one to believe that the current emphasis on the development of a new definition for universal service is a misdirected effort, because it is unlikely that it will ever be possible to formulate a definition that will be acceptable to everybody....
>
> Contrary to conventional wisdom, the development of universal service does not hinge on enlightened choices but on effective coalition building....
>
> Within the context of the above described phenomenon, a localized strategy is more likely to succeed, because each state is, in effect, a social laboratory where a unique set of circumstances can lead to a conceptual breakthrough.

Hearyon Kim, "The Politics of Deregulation: Public Participation in the FCC Rulemaking Process for DBS," *Telecommunications Policy*, 19:1, 1995, discusses the failure of public interest groups to sustain their participation in federal proceedings.

14. "In the Matter of Federal-State Joint Board on Universal Service," *Notice of Proposed Rulemaking and Order Establishing Joint Board*, Federal Communications Commission, CC Docket NO. 96-45, March 8, 1996 (hereafter, Notice), para 11, p. 7.

15. Edwin A. Rosenberg, *Universal Service and Its Funding* (National Regulatory Research Institute, March 1996), presents the results of a survey of state policies on universal service.

16. Econometric studies of telephone service show that income and price are by far the most important factors affecting demand for service. Mark N. Cooper, *Expanding the Information Age for the 1990s: A Pragmatic Consumer View* (American Association of Retired Persons and the Consumer Federation of America, 1992), presents a set of innovation adopting curves for several consumer products which link adoption to the price of the good relative to income.

17. Data for the early years of the century are rough estimates. The price of service in 1900 and 1910 are estimated as the cost of exchange service (John Robert Meyer, *The Economics of Competition in the Telephone Industry* (Oelgeschlager, Gunn & Hain, Cambridge, Mass., 1980), p. 34). Penetration rates are estimated by assuming one telephone per household and that the same proportion of business and residential telephones observed in 1920 were obtained in 1900 and 1910. This probably over-estimates the penetration of telephones in residences, since the early adopters were businesses.

18. Mueller recognizes the important role that falling prices played in the early years of the industry, although he directs his attention only to the period before 1900. Tthe real price of telephone service continued to decline through 1930, however.

19. Econometric studies of telephone penetration uniformly corroborate this conclusion. Income is consistently the most important factor determining penetration rates. Brooks Albery, "What Level of Dialtone Penetration Constitutes 'Universal Service'?," *Telecommunications Policy*, 19:5, 1995, p. 371, concludes that

> household income levels are a primary driver behind the telephone purchase decision. The results of this study confirm this by showing a strong correlation between statewide average personal income levels and statewide measurements of telephone penetration.

Studies which support the observation that income is the primary driver of telephone subscription include Lewis J. Perl, *Residential Demand for Telephone Service* (National Economic Research Associates, 1983); Richard M. Oveson, *Telephone Usage in Utah: A Consideration of Alternative Offerings* (University of Utah, Provo, 1984); J. H. Alleman, *The Pricing of Local Telephone Service* (U.S. Department of Commerce, 1977); B.E. Davis, G.J. Cacapolo, and M.A. Chaudry, "An Econometric Planning Model for American Telephone and Telegraph Company," *Bell Journal of Economics and Management Science*, 4:1, 1973; G.P. Mahan, *The Demand for Residential Telephone Service* (Michigan State University Public Utility Papers: East Lansing, 1979). Lestor Taylor, *Telecommunications Demand* (Cambridge Mass, Ballinger, 1980), pp. 79–82,) observed that the income elasticity is greater than the price elasticity, which is typical of a necessity good.

> A very small price elasticity and a moderate, but yet decidedly inelastic, income elasticity is precisely what one should expect for basic telephone service: access to the telephone system is not a plaything of the rich (at least in the developed countries), but has become a basic necessity for virtually all income groups...
>
> When substitution effects are large relative to income effects, consumers can substitute away from goods whose prices have risen with little loss in utility. However, when income effects are large relative to substitution effects, an increase in price means a relative large decrease in utility. Since the income effect is indicated to be large relative to the substitution effect in the price elasticity of demand for access for households with low incomes, the welfare of these households may be significantly decreased by increases in the price for basic service.

20. "Initial Comments of the American Association of Retired Persons, The Consumer Federation of America and Consumers Union," *In the Matter of Federal-State Joint Board on Universal Service, Notice of Proposed Rulemaking and Order Establishing Joint Board*, Before the Federal Communications Commission, CC Docket No. 96-45, April 12, 1996 (hereafter, Joint Comments); "Initial Comments of the Texas Office of Public Utility Counsel," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter OPUC).

21. Mueller downplays the significance of the law by citing legislative history which insists that the law broke no new ground. In fact, much of the judicial precedent that the law codified was at most a decade old.

22. *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia* (262 U.S. 679, 1923); *Federal Power Commission v. Hope Natural Gas Company* (320 U.S. 391. 1944); *Market Street Ry. Co. v. Railroad Commission of State of California* (324 U.S. 548, 1945); *Federal Power Commission v. Memphis Light, Gas & Water Division* (411 U.S. 458, 1973); Permian Basin Rate Cases (390 U.S. 747, 1968); *Duquesne Light Company et al. v. David Barasch et al.* (488 U.S. 299, 1989).

23. *Smith v. Illinois Bell Telephone Company* (282 U.S. 133 (1930); *Lindheimer v. Illinois Bell*, 292 US 151 (1933)).

24. One of Mueller's principle arguments is that because policymakers during this period made no direct reference to subsidies he questions whether public policy promoted universal service

> There is nothing in the text of the Act which can be construed as mandating or even suggesting a policy of subsidizing telephone penetration.
>
> There is a bit more substance to the alleged link between the system perspective and the pursuit of universal service, but even here the connection is tenuous and misinterpreted. The advent of rate-base regulation in the 1920s led to a long struggle over the board-to-board versus the station-to-station method of separating costs of local and long distance service.... In the debate over cost separation methods and policies up to 1947, there is no evidence of regulatory intentions to subsidize telephone penetration. One finds instead a complex set of compromises and negotiations among AT&T, state commissions, federal regulators, large independents, and small independents designed to solve the problems caused by the application of rate-base, rate-of-return regulation in a network that offered multiple products and spanned multiple jurisdictions. The real issue was not the promotion of universal service in the modern sense, but (1) how to define reasonable rates while ensuring that telephone companies would be adequately compensated for all of their properties, and (2) how to separate the rate base into federal and state jurisdictions (pp. 354–355).

Susan G. Hadden, "Technologies of Universal Service," in *Universal Telephone Service: Ready for the 21st Century?* (Institute for Information Studies, 1991), argues that cross-subsidies existed.

> That is, using its (perhaps excessive) profits from densely-populated areas or high-end services, a monopoly could subsidize other places or kinds of service that would otherwise be unprofitable. The system of cross-subsidies that kept the cost of local telephone service low was ratified as part of the regulatory bargain AT&T worked out over the years with the relevant state and federal regulatory bodies. In 1930, the Supreme Court clarified the issue, holding that some of the costs of providing local service should be allocated to long distance rates. The ensuing structural readjustment in rate setting reduced basic telephone tariffs to the point at which they were affordable for all Americans (p. 67).

That Mueller can find little reference to subsidies in the policy debate, while Hadden defines an explicit subsidy as the allocation of local costs to long distance, is not surprising. Neither of the authors starts from a precise definition of a subsidy nor examines the cost causation underlying the regulatory and legal decisions. It is the premise of the consumer position that the pricing scheme which evolved did not involve subsidization of telephone penetration but the allocation of the burden of shared costs (Richard Gable, *The Development of Separations Principles in the Telephone Industry* (Michigan State University Press, East Lansing, 1967)).

25. Econometric tools to analyze economies of scale and scope blossomed in the 1980s and these analyses confirm strong economies which had been observed at a less rigorous level throughout the history of the industry (for two comprehensive reviews of the literature, which cover data from 1947 to 1990, see Ferenc Kiss and Bernard Lefebvre, "Econometric Models of Telecommunications Firms: A Survey," *Revue Economique*, March 1987; National Economic Research Associates, *Economies of Scope in Telecommunications*, January 31, 1995).

26. Gable, *The Development.*

27. "Comments of the Ad Hoc Telecommunications Users," *In the Matter of Federal-State Joint Board on Universal Service, Notice of Proposed Rulemaking and Order Establishing Joint Board*, Federal Communications Commission, CC Docket No. 96-45, April 12, 1996.

28. Harry M. Trebbing, "The Chicago School versus Public Utility Regulation," *Journal of Economic Issues*, 10, 1976.

29. Richard Gable, *The Impact of Premium Telephone Services on the Technical Design, Operation, and Cost of Local Exchange Plant* (Public Policy Institute, American Association of Retired Persons, 1992).

30. Mark N. Cooper, *Developing The Information Age* (Consumer Federation of America, 1992).

31. Conference Report, p. 134.

32. Conference Report, p. 129.

33. Local Access Transport Areas (LATAs) were set up after the break-up of AT&T to separate areas where Regional Bell Operating Companies would provide services (intraLATA) and areas where interexchange carriers (long distance companies) would provide services (interLATA).

34. "Comments of the National Association of State Utility Consumer Advocates," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter NASUCA), p. 17); "Initial Comments of the Office of the Ohio Consumers' Utility Counsel," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter OCC), p. 3; OPUC, Texas, p. 4.

35. "Comments of Bell Atlantic," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter Bell Atlantic), p. 11–12 and NYNEX, p. 3.

36. "Comments of the State of Maine Public Utility Commission, the State of Montana Public Service Commission, the State of Nebraska Public Service Commission, the State of New Hampshire Public Utilities Commission, the State of New Mexico State Corporation Commission, the State of Utah Public Service Commission, the State of Vermont Department of Public Service and Public Service Board, and the Public Service Commission of West Virginia," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter Maine, et al.), p. 18; "Comments of the Idaho Public Service Commission," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter Idaho), p. 17); "Comments of the Public Utility Commission of Texas," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter Texas), p. ii; "Initial Comments of the Pennsylvania Public Utility Commission to the Notice of Proposed Rulemaking and Order Establishing Joint Board," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter Pennsylvania), p. 7.; Florida, p. 22; "Initial Comments of the Virginia Corporation Commission," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter Virginia), p. 5; "Comments of the Staff of the Indiana Utility Regulatory Commission," *In the Matter of Federal-State Joint Board on Universal Service*, Before the Federal Communications Commission, FCC 96-93, CC Docket No. 96-45, April 12, 1996 (hereafter Indiana), p. 9.

37. While this broad view of universal service is central to the 1996 Act, the FCC has taken a much narrower view in its first official reading of the law (Notice, para 11).

> The 1996 Act provides universal service support for two primary categories of services, each of which has two separate beneficiaries: (1) a "core" group of services, the provision of which is to be supported for consumers with low incomes or in rural, insular, and high-cost areas: and (2) additional services, including advanced telecommunications and information services, for providers of health care or educational services as described in Sections 254(b)(6) and 254(h). As we interpret the 1996 Act, our first responsibility is to identify what core groups of services should be supported by federal universal service support mechanisms to enable the first group of beneficiaries to purchase those services at just, reasonable, and affordable rates.

By focusing the Notice entirely on the questions of the special populations mentioned in some subsections of Section 254 (low-income consumers, those in rural, insular, or high cost ares, and public institutional telecommunications users) the Commission runs the risk of undermining the fundamental commitment that Congress made in the 1996 Act to preserve universal service for all Americans. Targeted subsidies should be encouraged where appropriate, but should not replace low rates for all users. The Act's fundamental premise is that this core group of services should be available to *all* consumers. The policy to ensure access for specific groups or rate parity between urban and rural customers was not intended to exclude urban customers or customers who are not "low-income" from continuing to receive basic service at an affordable rate.

38. National Economic Research Associates, Harry M. Trebing, "The Network as Infrastructure—The Reestablishment of Market Power," *Journal of Economic Issues*, 28:2, June 1994.

39. Notice, para. 14, p. 9.

40. Notice, note 12, p. 5.

41. Notice, note 13, p. 5.

42. Notice, para. 114.

43. *Webster's Third New International Dictionary*, Philip Babcock Grove (Ed.), (Merriam-Webster Inc., Springfield, Mass., 1986), p. 36.

44. *Merriam Webster's Collegiate Dictionary*, Tenth Edition (1995), p. 36

45. *Random House Webster's College Dictionary* (Random House, New York 1995), p. 24.

46. Mark N. Cooper, "Comments of the Consumer Energy Council of America," *In the Matter of Petition of the State of Michigan Concerning the Effects of Certain Federal Decisions on Local Telephone Service*, Before the Federal Communications Commission, CC Docket No. 83-788, September 26, 1983, pp. 7–8.

> We believe that the telephone is a vital necessity for the conduct of normal life in the United States today. It is a requirement for basic economic and social activity that has deeply affected living patterns. We define universal service as access to the telephone for the common purposes to which it is generally put in society. Therefore, we reject the Commission's efforts to restrict the concept of universal service to what is, essentially, a lifeline. To argue that a simple emergency line meets the social goal of universal service would be to deny low-income households access to the fundamental social and economic value that the telephone embodies.
>
> Based upon our concept of the telephone and universal service, we believe that the Commission must gather extensive data on the pattern of telephone usage by households at various income levels and on the changes that rate increases cause in those patterns. Disconnects are not an adequate measure of universal service. If households remain connected but are forced to go from full service to some meager lifeline, that constitutes a setback for universal service. If households maintain their full service, but are forced to dramatically curtail their use of the telephone, that too may constitute violation of the essence of universal service. The Commission must ask not simply whether the telephone receiver is in the house; it must also ascertain whether it is being used and why usage patterns have changed.
>
> Similarly, we believe that the Commission must examine the burden that expenditures on telephone bills place on household budgets. If households cling to their full service and are forced to slash their expenditures on other commodities, the telephone rate increases would be violating the principle of universal service. In other words, affordability must be seen as part of universal service.
>
> The Commission's approach which says, in essence, that a household that does not disconnect, no matter how burdensome preserving service may be, constitutes evidence that the universal service goal is being met, is unacceptable. In the case of necessities such as food, clothing, energy, shelter, and telecommunications, households will struggle to keep the service by cutting back on the consumption of other goods. We maintain that access to adequate telephone service must not be priced so high as to erode the quality of life of households. We must not force households to choose between being able to communicate in and with the mainstream of society and acquiring the other basic necessities of life.

47. Stephen Graham, James Coronford, and Simon Marvin, "The Socio-Economic Benefits of a Universal Service Network: A Demand-Side View of Universal Service," *Telecommunications Policy*, 20:1, 1996, p. 9, offer the following observation.

> Further benefits relate to the costs involved in the operation of markets, especially the labor and housing markets... Households use the telephone as part of the information search associated with finding work or identifying suppliers of goods and services.

48. It is now widely accepted that access to the telephone provides a basic support to social and economic participation in modern Western society. Modern society and economies rely fundamentally on intense telephone-based interactions across distance and at every level....

> Worry about telephone penetration rates derives from the increasing *relative deprivation* of people who cannot afford to be on the telephone (or who, once connected, feel that they cannot afford to make calls)....
>
> The problem is that some of the groups most in need of the information and advice about their rights are among those least likely to have access to a domestic telephone. And even those who do may find their use curtailed by the high cost of making calls. For non-telephone households, social and economic participation will be increasingly difficult, and it will become ever more difficult to exercise the rights of citizenship without access to a telephone (Graham, et al., pp. 4–7).
>
> The impact of the telephone has been particularly powerful because the connections it creates have more to do with human interaction than the movement of materials or energy. The telecommunications networks are not mere conduits for transporting information. They are the symbolic threads that tie all of us together. Ironically, this sense of unity comes through physical connectivity with total strangers via technological systems (Sawheny, p. 381).

49. Colin R. Blackman, "Universal Service: Obligation or Opportunity," *Telecommunications Policy*, 19:3, pp. 172–74, offers the following observation.

> Access to telecommunications services is a basic right of all citizens (the right to communicate) which is essential for full participation in the community and as a basic element of the right to freedom of expression.

In the USA there is a strong sense that information means empowerment and consequently the government has a duty to ensure that all Americans have access to information; the concept of universal service is being expanded to ensure that information resources will be available to all at affordable prices.

One of the arguments for universal service is that access to many of the modern services, including telecommunications, is a basic human right. Every person has a right to these services by the mere virtue of being a citizen.... The moral basis of this claim is that telecommunications services have now become so important that an individual without access to them is not equipped for everyday life. The telephone is no longer a luxury. It is a necessity in a modern society (Sawheny, p. 378).

50. William H. Melody, "Toward a Framework for Designing Information Society Policies," *Telecommunications Policy,* 20:4, 1996.

If universal connection (rather than merely access) is defined as a suitable policy goal in the interest of society as a whole, universal service policy needs to be expanded to take into account the subscription and usage, as well as access issues (Graham, et al, p. 10).

51. Susan E. McMaster and James Lande, *Reference Book: Rates, Price Indexes, and Household Expenditures for Telephone Service* (Industry Analysis Division. Common Carrier Bureau, Federal Communications Commission, November 1995).

52. "Direct Testimony of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons," *Comprehensive Review of the Revenue Requirement and Rate Stabilization Plan of Southern Bell Telephone and Telegraph Company*, Florida Public Service Commission, Docket No. 900960-TL, November 2, 1992.

53. Mark N. Cooper, *The Telecommunications Needs of Older, Low-Income, and General Consumers in the Post-Divestiture Era* (American Association of Retired Persons and the Consumer Federation of America, October 1987).

54. The expanding nature of basic service has been widely commented upon in recent public policy debates (see Sawheny; Hadden; Dordick, 1991; J. Gillan, "Universal Service and Competition: The Rural Scene," *Public Utilities Fortnightly*, 117:10, 1986; H.E. Hudson and E. B. Parker, "Information Gaps in Rural America: Telecommunications Policies for Rural Development," *Telecommunications Policy*, 14: 1990.

55. As information services become ever more ingrained in our society through the use of personal computers and interactive information services (eg banking at home, the virtual office, etc) questions regarding the definition of the basic level of service will focus on the speed and/or bandwidth at which data can traverse the last mile of the telecommunications network (Albery, pp. 365–66).

'Universal service' will soon have to include 'a reliable world class telephone service; a data service of at least 9600 bps; a facsimile capability; electronic mail capability; a mobile two-way voice service; as well as broadcast radio and television services; and a postal service (Graham, et al., p. 4).

Its premise is that adequate functioning in an "information society" will require access to at least some kinds of information, and that these should be readily available to all at low or no cost... this is not a novel form of universal service. State laws requiring a free public education, public libraries, labeling requirements ensuring that consumers can obtain information necessary to a reasoned purchase, and both worker and community right-to-know are all precedents that have ensured people access to free information. It is worth noting that these precedents uniformly entail providing information that benefits society as a whole that individuals either have little incentive to obtain or simply cannot obtain unassisted (Hadden, p. 81).

Information has become the most valuable currency of our society, if not the world, as nations strive to become information economies.

Nations must compete in a global market and telecommunications have become both the transportation and distribution routes for this market; and domestic and international markets can no longer be served by well-defined single-function telecommunications networks, but rather must be served by many multi-purpose, often competitive, public and private networks providing voice, data, video, and images, over wire and by radio (Dordick, 1991, p . 123).

56. Notice, para 14, p. 9, para 15 p. 10, and para 16, p. 10.

57. Notice, note 42, p. 11.

58. Minimum quality of service, non-discrimination, subscriber directories, operator assistance, and directory enquiry services, public payphones, access to emergency services, provision of service to those with special needs (Blackman, p. 173).

Universal service has come to mean more than access to a dial tone at reasonable cost: Quality of service; provision of single-party rather than multi-party lines, especially in rural areas; the expectation of privacy; and, in some states, touchtone dialing rather than rotary dialing are the norm. The telephone is no longer "plain" nor "old"; discretionary services such as call waiting, call forwarding, three-way calling, voice mail, call blocking and, in some areas of the nation, caller identification have significantly increased the usefulness and value of the telephone (Dordick, p. 123).

There is general agreement that the definition of universal service needs to be extended beyond basic voice communications. Scholars and policymakers have accordingly focused their attention on the redefinition of universal service. The National Telecommunications and Information Administration suggests that expanded basic service should include touchtone, emergency communication services (e.g., 911), services for the hearing impaired, and equal access to competitive long distance. Others have sought to include voice, video, and data in the redefined universal service. Some have even suggested that redefined universal service should include access not only to communications networks but also to information services (Sawheny, p. 376).

59. Notice, para. 9, p. 6.

60. Section 251(c)(3).

61. Sections 254(c)(3) and (h).

62. Section 254(h)(1)(A).

63. Section 254(h)(1)(B).

64. Section 254(h)(2).

65. As a network becomes established, emphasis might typically be on finding technological solutions to provide long distance service linking all major centers. As the network grows, emphasis might shift to ensuring service is available in all geographic areas on the same basis. At the next stage, which might mean stimulating take-up by the mass market, universal service goals will be primarily economic with the desire to keep installation and rental charges low. Finally, as the network reaches saturation, universal service will focus on social goals and will be concerned with ensuring telephone service is affordable for all and meets special needs (Blackman, p. 172).

66. American Association of Retired Persons and the Consumer Federation of America, *Universal Service Requirements for the Information Age*, 1994.

67. "Universal Service Proposal Adopted," *In the Matter of the Investigation of Universal Service in the State of Oregon*, Public Utility Commission of Oregon, Order Number 95-1103, October 17, 1995.

68. Joint comments.

69. Direct Testimony of Dr. Mark N. Cooper, Florida Public Service Commission, 1992.

70. The awareness of the public goods nature of the telecommunications network has been reinvigorated with the growth of the Internet and heightened concern that commercial pricing of Internet use would undermine its fundamental nature.

> There is a third class of economic goods that fall between pure private goods and pure public goods. These are goods with externalities. The unintended spillover of any good is called an externality. If the spillover is positive, then the positive externality is a benefit, if the spillover is negative, then the externality is a cost....
>
> Externalities are themselves of two economic types. Public goods externalities are non-excludable and non-depletable.... Private goods externalities are externalities that are depletable but not (effectively) excludable (Martyne M. Hallgren, "Funding an Internet Public Good: Definition and an Example," *Computer Networks and ISDN Systems*, 27, 1994, p. 405).
>
> Many of the networks run currently on good-will and cooperation rather than any form of regulation....
>
> The rapid growth in EN [Electronic Networks] has thus been a consequence of almost free connection (local joining costs only), free software, and free information from library catalogues, documents, and databases across the world...
>
> The pricing of EN is the key to its commercial success....Centralised charging of point-to-point connections (like telephone calls) would not be the most appropriate method for the network and would not take advantage of the intelligent infrastructure. The pricing system should not punish for use or provide restrictions on communication based on cost.

Billing needs to take into account which of the many networks were used and how much they were used and how they are to be paid. There is also a wide variety of network tools and services which work in diverse ways and need diverse pricing to provide for the most effective cost/use arrangements. For example, searching many computers across the world at once would prohibit charging for a single connection like phone calls, however charging for every email message (which is based on short, frequent messages more like phone calls) could become very expensive to maintain (in fact more expensive than sending the actual message), unless smart solutions are developed.

Any overcharging for communications services would see a dramatic decrease in user appeal and interest from business, especially in competition with fax and telephone. This is a key area and much debate is required before any implementation (Daniel Ingvarson, Dora Marinova, and Peter Newman, "Electronic Networking: Social and Policy Aspects of a Rapidly Growing Technology," *Computer Networks and ISDN Systems*, 27, 1994, pp. 413–14).

The system of systems might have the technical capacity for a large number of voices, yet it may still result in a narrower spectrum of information if systems integrators have gatekeeper powers. The need for the various systems to access each other, and for information to travel over numerous interconnected carriers, mean that the restrictiveness of any one of the participants would require everyone else to institute content and usage tests before they can hand over or accept traffic, or they must agree to the most restrictive principles. Information travels across numerous sub-networks until it reaches its destination, and nobody can tell one bit apart from another bit. If each of these networks and systems integrators sets its own rules about which information is carried and which is not, information would not flow easily (Eli Noam, "Beyond Liberalization: From the Network of Networks to the System of Systems," *Telecommunications Policy*, 18:4, 1994, p. 292).

71. But, and it is a very big but, uneconomic customers *receive* telephone calls from *economic* customers. There is value just in having people connected to the network, the so-called network externality argument. And the uneconomic customer of today may well turn out to be a competing operator's economic customer tomorrow. So there is value to incumbent operators keeping uneconomic customers connected. Indeed, it is argued by some that providing universal service is not an obligation at all but rather an opportunity and a privilege...

Economists would argue that there are three arguments which could be made in favour of providing a subsidy:

1) If it is a basic, public, social good.

2) If it is a transactional good—the network externality argument, i.e. there is a value in having a ubiquitous network.

3) If it is a merit good, e.g., people may or may not want it but we think it is good for them (Blackman. p. 173–74).

Each consumer on the network has some stake in the network being as large as possible. With the growing importance of business to residential telephone lines in the private sector—telemarketing and market research being examples—direct economic spin-offs for business of network extension can also be foreseen (Graham, et al, p. 8).

72. The system benefit argument is more powerful than the one based on individual rights because it appeals to self-interest rather than altruism. The basic argument here is that the provision of a service on a universal basis makes it possible for the social system as a whole to function more efficiently (Sawheny, p. 379).

73. This recommendation converges with the discussion of the need to enhance delivery of services to consumers with disabilities. The popularization of ISDN would advance the interests of consumers with disabilities by making a broad range of services readily achievable for these consumers. There is also great promise in this approach to advanced services through a computer-based platform for disabled consumers. For disabled consumers there are already speech synthesizers, screen reading programs, braille editors, enlarged text computers, visual prompt programs, input devices for those with motor disabilities, word prediction programs, and grammar checkers, to name just a few of the technologies, which will put to shame the antiquated system embraced by the telephone companies that combines the teletype and the Pony Express.

Digitization is the curb cut that renders all messages—voice, video, and data—equal in the telephone network. It opens the information age to those who need the vast translation technology that already exists in order to have their communications move seamlessly through the network.

74. Conference Report, pp. 132–33.